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Appendix S

Water Supply Assessment

Darden Clean Energy Project

Water Supply Assessment

prepared for

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Acronyms

AE	Agricultural Exclusive
AF	acre-feet
AFY	acre-feet per year
ASR	aquifer storage and recovery
CVP	Central Valley Project
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
DWR	Department of Water Resources
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GW	gigawatt
kV	kilovolt
MAF	million acre-feet
PG&E	Pacific Gas and Electric
PMAs	projects and management actions
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USBR	U.S. Bureau of Reclamation
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WSGM	Westside Groundwater Model
WWD	Westlands Water District

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1 Introduction

This Water Supply Assessment (WSA) has been prepared for the Darden Clean Energy Project (Project) to characterize the Project's anticipated water demands, identify the Project's proposed sustainable water source, and demonstrate the viability and reliability of the proposed water source. The Project proposes to construct a 1,150-megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600 megawatt-hour (MWh) battery energy storage system (BESS), an up to 1,150 MW green hydrogen production facility, a 34.5-500 kilovolt (kV) grid step-up substation, a 10- to 15-mile 500 kV generation intertie (gen-tie) line, a 500 kV utility switchyard and appurtenances. The majority of the Project will be developed on lands owned by Westlands Water District (WWD) that are no longer viable for agricultural production. It is anticipated that the Project will be constructed over a period of 18 to 36 months. Figures provided on the following pages show the Project's regional location (Figure 1), the Project site plan (Figure 2), and the extent of WWD's service area (Figure 3).

Water demands for the Project include typical construction-phase water uses (e.g., dust control). The solar generation facility and related electricity components are projected to use comparatively low-levels of water for maintenance activities including panel washing. The Project's greatest use of water will be to support electrolysis in the production of hydrogen. The production of hydrogen by electrolysis represents a notable increase in water demand over a solar generation facility; however, the Project's green hydrogen water demands are far lower than the water demands of the historical agricultural land uses of the overall Project site.

The Project's construction-phase water demand has been calculated as approximately 1,100 acre-feet (AF) over 18 months to 1,210 AF over 36 months, depending on the construction timeline. The Project's operational water demands have been calculated at a total of 1,039 AFY, with 1,000 AFY representing the hydrogen production demand and 39 AFY representing all other operational water demands.

This WSA assesses the Project's water demands as well as supply availability and reliability over a future projection of 20 years. Based on the calculated water demands of the Project, over 20 years the Project's total water demand is estimated between 21,880 AF to 21,990 AF depending on the construction period duration. For the purposes of this WSA, the Project's total water demands are assumed to be up to 21,990 AF total, inclusive of the Project's solar component as well as its electrolyzer demands.

A property-based groundwater allocation will be used to provide 56 AFY for the Project, or approximately 1,120 AF over the 20-year planning horizon, to meet the Project's municipal and operational demands for the solar component. Annual production in accordance with this groundwater allocation is consistent with WWD's established policy and groundwater management planning. Water for Project construction and the electrolyzer operational demands will be met with wet weather surplus flows from the extremely wet 2022/2023 water year, which will be obtained from WWD and stored through groundwater banking for use as needed. Based on the substantial surplus of water from the 2022/2023 winter and the availability of this surplus for sale, the Project will acquire and bank 20,870 AF in the Westside Subbasin for construction and electrolyzer use; this is the amount required over the 20-year projection considered herein, less the 1,120 AF of water that will be acquired through property-based groundwater allocations for the solar component of the Project. Water demands are detailed in Section 2.2, *Project Water Demands.*

Figure 1 Project Regional Location

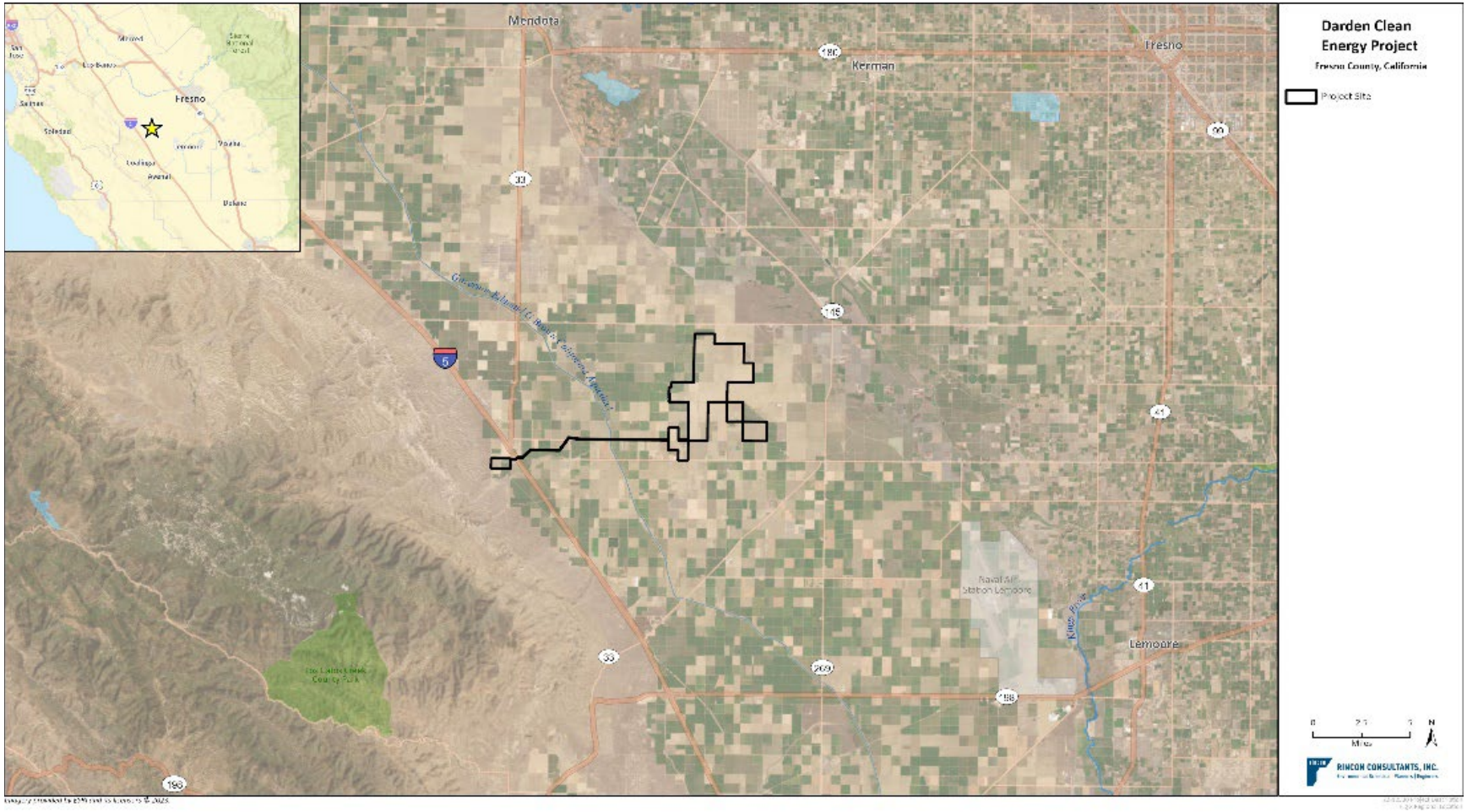


Figure 2 Project Site and Component Locations Map

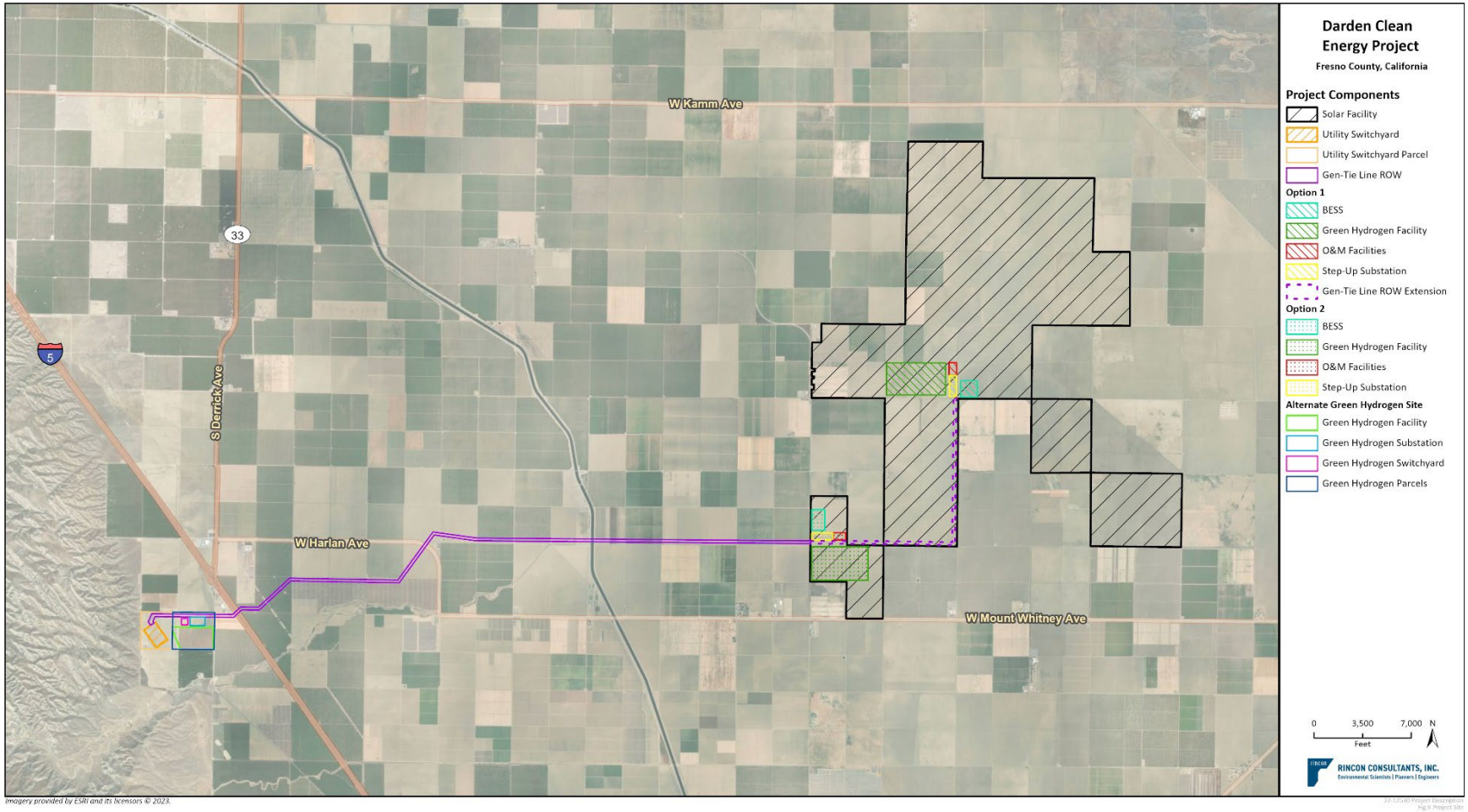
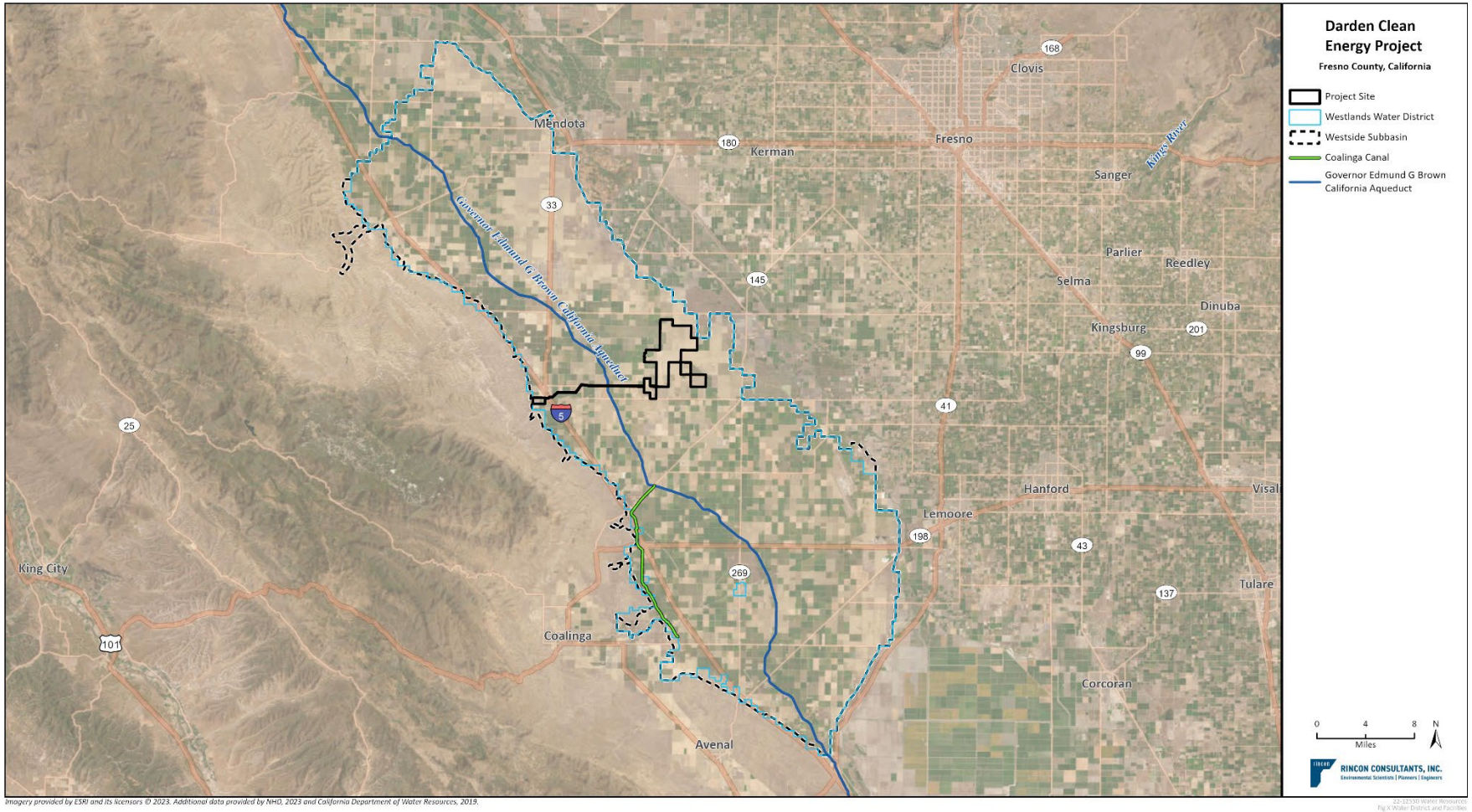


Figure 3 Westlands Water District Service Area



1.1 Report Contents

The following sections of this WSA contain information including:

- Section 2, *Project Description*, provides an overview of the Project, including water demands associated with construction and operation.
- Section 3, *Water Supply Context,* characterizes surface water and groundwater supply sources in the Project area.
- Section 4, *Water Supply for the Project,* describes two components of the proposed water supply scenario for the Project.

2 Project Description

The Project consists of the construction, operation, and eventual repowering or decommissioning of a 1,150 megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600 megawatt-hour (MWh) battery energy storage system (BESS), an up to 1,150 MW green hydrogen production facility, a 34.5-500 kilovolt (kV) grid step-up substation, a 10- to 15-mile 500 kV generation intertie (gen-tie) line, a 500 kV utility switchyard along the Pacific Gas and Electric Company (PG&E) Los Banos-Midway #2 500 kV transmission line, and appurtenances. Figure 1 shows the regional location, and Figure 2 provides an overview of the site layout. Project components are further described below.

2.1 Project Characteristics

Construction of the Project is anticipated to take 18 to 36 months to complete and the Project would be operational by 2027 or 2028. The Project would include the following major components:

Solar Facility, Step-Up Substation, and Gen-tie

- Construct a 1,150 MW solar PV facility, consisting of approximately 3,100,000 solar panels, inverter-transformer stations, and an electrical collection system. The collection cables would be buried underground in a trench about 4 feet deep, with segments installed overhead on wood poles to connect all of the solar facility development areas to the on-site step-up substation.
- Construct a new substation to step-up the medium voltage of the PV collector system from 34.5 kV to 500 kV, located on approximately 20 acres. Two locations (Option 1 and 2 sites) are being considered for the step-up substation.
- Construct operations and maintenance facilities with employee accommodations (e.g. restrooms).
- Construct an approximately 10 to 15-mile 500 kV gen-tie line, consisting of monopoles or H-frames, and dead-end structures, to interconnect the step-up substation to a new utility switchyard. The gen-tie line would be located within an up to 275-foot wide corridor.

BESS

- Construct a battery storage system capable of storing and discharging up to 1,150 MW of electricity for four hours (up to 4,600 MWh), located on approximately 35 acres.

Green Hydrogen Facility

- Construct an up to 1,150 MW green hydrogen production facility, consisting of an electrolyzer and ancillary equipment such as water treatment facilities, filters, storage tanks, backwash systems and chemical dosing systems.

Three locations are being considered for the green hydrogen facility. The Option 1 and Option 2 sites would be approximately 225 acres in size and would be located within the solar facility site. In addition, an approximately 100-acre alternate site located west of Interstate 5 is being considered. If the alternate site is selected, it would include the construction of a substation and switchyard on approximately 20 additional acres, as well as an operations and maintenance facility with employee accommodations (e.g. restrooms).

Utility Switchyard

- Construct a PG&E-owned switchyard, consisting of high-voltage circuit breakers, switches, and series capacitor line compensation equipment in a breaker-and-half configuration, to electrically connect the Project's generation onto PG&E's 500 kV transmission network. The utility switchyard would be located on approximately 40 acres.

Upon completion of the Project's operational lifetime, Project facilities would be either repowered or decommissioned. As described under "Decommissioning," below, due to the Project's anticipated operational lifetime of up to 35 years, it is likely that developments in technology, dust control, and water supply systems will occur over the Project's lifetime. This WSA considers water demands and supply availability over a 20-year planning horizon. Following decommissioning, the Project site would be restored and reclaimed to the extent practicable to pre-construction conditions consistent with site lease agreements.

2.2 Project Water Demands

The Project would introduce temporary construction-related water demands and long-term operational water demands. The Project's water demands are detailed below, including 1,100 to 1,210 acre-feet (AF) for construction, and 1,039 acre-feet per year (AFY) for operation and maintenance.

Construction

Water demand for on-site activities associated with Project construction would be primarily related to dust suppression for ground disturbance and installation of Project components; water during construction would also be required for revegetation activities.

Construction would occur over a period of 18 to 36 months and water demands have been calculated and analyzed for the shortest and longest duration construction periods. Construction water demands would total approximately 1,100 AF over an 18-month construction period, up to 1,210 AF over a 36-month construction period. The water use during construction would increase slightly as the construction period increases in duration.

Operation

Water demand during operation of the Project would be approximately 1,039 acre-feet per year (AFY) related to the following:

- washing solar panels to maintain efficiency;
- supplying the electrolyzer with water to produce hydrogen via electrolysis, also referred to as "feedstock" water;
- supplying sanitary facilities in the O&M building; and
- watering sheep used for vegetation management.

Table 1, below, provides an overview of operational water demands for the Project.

Table 1 Operational Water Demands

Water Use	Annual Operational Demand
PV Panel Washing and Vegetation Management	25 AFY
Solar Facility O&M Building and initial Landscaping Establishment	10 AFY
Alternate Green Hydrogen Facility O&M Building	4 AFY
Electrolyzer Feedstock Water	1,000 AFY
Total	**1,039 AFY**

As noted, water quality treatment is required for feedstock water; this is because the process of electrolysis requires very high-quality feedstock water. Therefore, the Project would include an on-site reverse osmosis (RO) and Electrode ionization (EDI) system for water quality treatment. The RO/EDI system would concentrate dissolved solids existing in the raw water feedstock, while extracting pure water from the feedstock. The waste stream produced by this process is a brine that is higher in total dissolved solids (TDS) than the raw water feedstock, and would need to be disposed of. Several options for brine disposal are currently being considered, including disposal via deep injection well, disposal by discharge to land, incorporating a zero-liquid discharge system that would produce solid waste for disposal, among others.

Decommissioning

At the end of the Project's operational timeline, the Project may be decommissioned, and the site would then be restored and reclaimed to the extent practicable to pre-construction conditions, consistent with site lease agreements. This process may involve water demands for dust suppression, similar to the construction water demands. However, decommissioning would occur well beyond the 20-year planning horizon required for a WSA, and it is likely that developments in technology, dust control, and water supply systems will occur over the Project's lifetime. Therefore, while this WSA acknowledges some water may be required to support the decommissioning period, the analysis provided herein focuses on the construction and operational water demands.

Summary of Demands

Table 2, below, presents the Project's total water demands, summarized by type. This table shows total water demand would be up to 21,990 AF for the combined construction and operational water demands over the required future projection of 20 years.

Table 2 Summary of Water Demands

Demand Type	Water Demand (per year)	Water Demand (total)
Construction		
18 months (1.5 years)	733 AFY	1,100 AF
36 months (3 years)	403 AFY	1,210 AF
Operation		
PV solar and M&I, 20 years	39 AFY	780 AF
Electrolyzer, 20 years	1,000 AFY	20,000 AF

Demand Type	Water Demand (per year)	Water Demand (total)
Total Construction + Operation[1]		
Total water demand (18-month construction)		21,880 AF
Total water demand (36-month construction)		21,990 AF

1. The Project's total water demand is provided as a range to account for construction duration ranging from 18 to 36 months. To provide a conservative analysis, the combined construction and operational water demand is assessed as 21,990 AF, accounting for the maximum construction duration of 36 months.

Project Water Supply

Two different and complimentary water supplies have been identified for the Project: land purchase with annual groundwater production and surplus surface water flow for long-term banking. These supplies are summarized below with additional details provided in Section 3, *Water Supply Context*.

Land with existing water rights would be purchased for inclusion in the Project site, and the groundwater allocation would be used to provide solar and municipal and industrial (M&I) water supply for the Project. As stipulated in the Option Agreement between WWD and Project companies, the conferred M&I rights consist of 2 AF of groundwater per 320 acres of land per year to support solar development. For the purposes of this WSA, it is conservatively assumed that 9,000 acres of land with attached groundwater rights would be acquired for the Project, providing up to 56 AFY of groundwater extraction rights for the Project. This is a conservative approach because the total amount of WWD land that would be conferred to Project companies would be up to 9,116 acres. This component of the Project's proposed water supply would be resilient in normal, dry, and multiple dry years because it comprises only 0.02% of the Westside Subbasin's sustainable yield, and because the groundwater right of 2 AFY per 320 acres of land was established through the 2015 settlement agreement and the confidential Option Agreement between WWD and Project companies. In addition, withdrawal of groundwater at this rate (2 AFY for 320 acres) is far below WWD's calculated sustainable rate of groundwater withdrawal in the Westside Subbasin, which is approximately 0.6 AFY per acre, or 192 AFY for 320 acres.

Water for the Project would also be secured through purchase of Supplemental Water and/or Turn Back Pool surplus water through WWD and purchases directly from private landowners of excess allocations. Acquisition of this wet weather surplus flow would occur from water year 2022/2023 excess supply that the Project would purchase and put into storage in the Westside Subbasin aquifer for future use. Water banking credits would be generated through storage and WWD authorization, and the water would be extracted using onsite groundwater production wells (less leave-behind quantities) in future years. This surplus water supply is available in quantities greater than Project demands (43,000 AF currently available) and is being advertised for purchase from WWD. The banked component of the Project's proposed water supply would be unaffected by normal, dry, and multiple dry years because banked water is currently not subject to WWD's limitations on groundwater allocations. The amount of water that would be banked in advance is sufficient to support Project demands throughout the coming 20 years. No direct impacts to the groundwater basin or its beneficial uses and users would occur during dry and multiple-dry years because the Project water would be banked in advance of withdrawals and would not exceed banked volumes except to the extent of up to 2 AFY permitted under the WWD settlement.

Water supplies identified to cumulatively serve Project demands over the next 20 years are described in detail in Section 3, *Water Supply Context* for the Project.

Water System Requirements

There is not an existing public water system[1] that would serve the Project. Project design indicates that a water system to support the Project activities and human consumption by on-site operational workers would be identified as a Non-transient Noncommunity (NTNC) Water System, regulated through the State Water Resources Control Board (SWRCB). An application for a water system is required to be submitted to the SWRCB local agency office to ensure compliance with mandatory State and federal drinking water requirements. In addition, regulatory and engineering requirements associated with water system development, treatment, ongoing operation and maintenance, and reporting requirements are subject to compliance with all State and federal water quality standards.

2.3 Existing Site Conditions

This section presents information on the existing conditions of the project site relevant to groundwater rights. Parcels included throughout all components of the Project site are currently agricultural in nature.

Land Cover

Land cover types are predominantly retired agricultural lands that have been irregularly farmed over the last 10 years and seasonally or annually disked when not growing crops, and associated dirt roads, field and road shoulders, basins, ditches, and berms. Some active farming occurred in limited areas on the Project site during 2023. Surrounding properties include retired and active agricultural lands. The Project's gen-tie line spans privately-owned land on the western portion of the Project site with land-cover types including active agriculture. The California Aqueduct bisects the gen-tie parcels, running generally north-south. Compacted dirt and paved roads border and separate each land-cover type.

Site Use Restrictions

On September 15, 2015, the U.S. Department of Justice (USDOJ) and WWD approved a settlement ending a decades-long dispute over the U.S. Bureau of Reclamation (USBR) responsibility to provide drainage for the farmland within WWD's service area, including the primary PV development area. The settlement required permanent retirement from agriculture of a minimum of 100,000 acres, including those lands within the proposed PV development area.

WWD is actively pursuing retirement of these 100,000 acres of agricultural land within its boundaries (WWD GSA and County of Fresno GSA-Westside 2022a); this includes up to 9,116 acres within the Project site. As discussed in Section 2.2, *Project Water Demands,* under "Project Water Supply," for the purposes of this WSA it is conservatively assumed that 9,000 acres of land with attached groundwater rights would be conferred to Project companies, providing up to 56 AFY of groundwater for the Project. Upon transfer of the land to the Project companies, a non-irrigation covenant is required by WWD to be recorded on each property. As such, irrigation would no longer occur on the Project parcels.

[1] California Water Code (CWC) Section 10912(c) defines a "public water system" as a system that has 3,000 or more urban service connections and provides piped water to the public for human consumption. The project site is located in a historically agricultural area, in the central portion of WWD's service area. WWD provides a total of 232 urban use connections including commercial, industrial, and institutional uses (WWD 2017a) (WWD GSA and County of Fresno GSA-Westside 2022a).

Under the terms of the settlement agreement, 2 AFY of groundwater may be produced for every 320 acres of land as an allocation of groundwater rights attached to land ownership. Water demands for solar energy development are generally substantially less than water demands for irrigated agriculture, which previously occurred across the Project site. Therefore, the use of groundwater allocations attached to land ownership is consistent with the purpose of the Westside Subbasin Groundwater Sustainability Plan (GSP) to reverse overdraft conditions and restore sustainable balance of inflows (replenishment) and outflows (water demands) within the Westside Subbasin.

Urban Water Management Plan

There is no Urban Water Management Plan (UWMP) that accounts for the Project water demand. In California, every urban water supplier (publicly or privately owned) that delivers more than 3,000 AFY of water annually or serves more than 3,000 urban water connections is required to prepare an UWMP to assess and manage the reliability of the supplier's water sources over a 20-year period, and also consider normal water-year, single-dry water-year (periodic drought), and multiple-dry water-year (sustained drought) scenarios.

Although the Project site is located within the WWD service area, WWD is not an urban water supplier and does not have an UWMP due to its connections being primarily for agricultural and irrigation purposes. There are no other water providers that have a UWMP covering the Project site.

Groundwater

Groundwater would be a component of the water supplies for the Project, and would be produced from Project parcels in amounts up to existing groundwater allocations attached to property ownership, for 2 AFY per 320 acres of land. The Project site is underlain by the Westside Subbasin of the San Joaquin Valley Groundwater Basin (SJVGB), which is discussed in detail below.

In addition, the Project would include the use of aquifer storage and recovery (ASR) to bank surface water obtained as surplus flows from WWD for use as needed during Project operation. The ASR project would occur in the Westside Subbasin which underlies the Project site, and would be developed and implemented in coordination with WWD. Water would be recovered from the ASR bank in amounts not exceeding the amount of surplus surface flows that are contributed to the bank under the proposed Project. As such, the Project would not directly consume native groundwater as a result of conducting ASR in the Westside Subbasin.

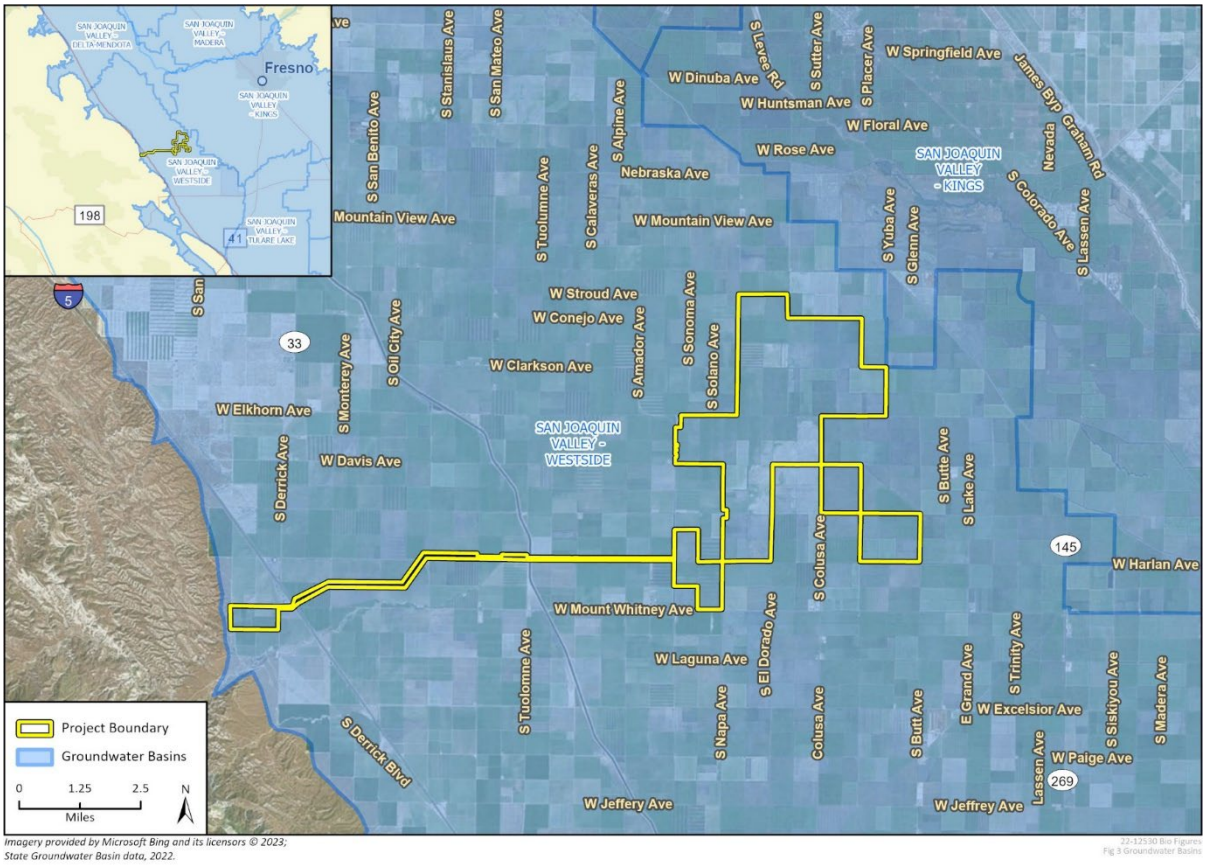
3 Water Supply Context

This section provides an overview of the existing and available water supplies within the Project area, including groundwater and surface waters. Section 3.1, *Local Groundwater Conditions,* establishes the context for the proposed annual groundwater production of 56 AFY. Section 3.2, *Local Surface Water Conditions*, establishes the context for the proposed wet weather surplus flow purchase and banking of 20,870 AFY to meet the Project's remaining demands over the 20-year planning horizon, less the 1,120 AF of groundwater that would be acquired through allocations attached to land ownership.

3.1 Local Groundwater Conditions

The Project site is underlain by the Westside Subbasin of the SJVGB. The SJVGB is bounded to the north by the Sacramento-San Joaquin Delta and Sacramento Valley, to the east by the Sierra Nevada Mountains, to the south by the San Emigdio and Tehachapi Mountains, and to the west by the Coast Ranges (City of Fresno 2021). The SJVGB is comprised of 19 subbasins, including the Westside Subbasin, which is detailed below in Section 5.1, *Westside Subbasin*. Figure 4, below, provides the location of the Project site within the Westside Subbasin.

Figure 4 Project Site and Groundwater Resources



The figure above shows the Project site is approximately centered within the Westside Subbasin, with the solar facility site located along the subbasin's eastern boundary, and the gen-tie line traversing in an east-west alignment to the subbasin's western boundary.

3.1.1 Westside Subbasin

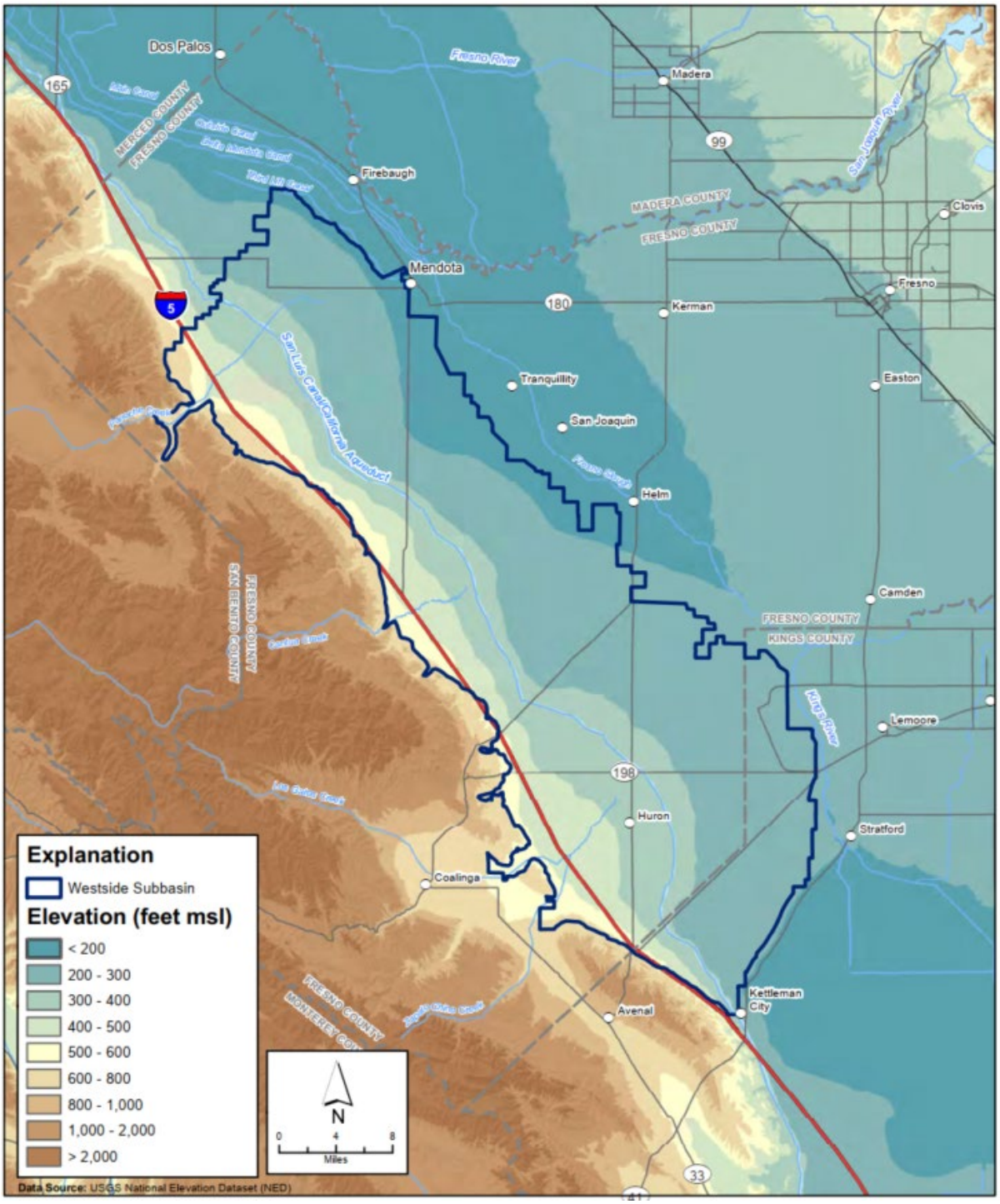
The Westside Subbasin covers 972 square miles (622,080 acres) in the western portion of the SJVGB and is designated by DWR as Critically Overdrafted (DWR 2023a). SGMA requires all groundwater basins in the State to be brought into sustainable conditions by 2040, with sustainable conditions demonstrated to the DWR through 2070. The purpose of the GSPs is to reverse overdraft conditions and increase local supply development to facilitate achievement of sustainable conditions in the subbasin.

In the Westside Subbasin, geologic units are deposited in four layers, identified in order of increasing depth as the Shallow Zone, Upper Aquifer, Corcoran Clay, and Lower Aquifer:

- **Shallow Zone.** The Shallow Zone consists of the first approximately 100 feet below the ground surface (bgs) and above the Upper Aquifer. The Shallow Zone is not hydrologically connected to the Upper Aquifer; therefore, it is not defined as one of the primary aquifer units in the Westside Subbasin (WWD GSA and County of Fresno GSA-Westside 2022a).
- **Upper Aquifer.** The Upper Aquifer is a defined water-bearing zone that lies below the Shallow Zone and above the Corcoran Clay of the Westside Subbasin. The Upper Aquifer consists of sedimentary deposits which are generally western-sourced, alluvial fan deposits considered part of the upper Tulare Formation, although it is difficult to separate this formation from overlying younger alluvium. The Upper Aquifer is characterized by poor water quality (WWD GSA and County of Fresno GSA-Westside 2022a).
- **Corcoran Clay.** The Corcoran Clay layer is an extensive geologic unit that extends throughout most of the Westside Subbasin. It is comprised of low-permeability lacustrine (lake) deposit which forms a continuous clay layer and barrier to groundwater movement. The Corcoran Clay layer divides groundwater flow into an upper semi-confined zone (Upper Aquifer) described above, and a lower confined zone (Lower Aquifer) described below (USGS 2012).
- **Lower Aquifer.** The Lower Aquifer is located below the Corcoran Clay layer, separated from the Upper Aquifer except in the southwestern portion of the subbasin, where no horizontal barrier exists between the Upper Aquifer and Lower Aquifer. Most historic pumping in the Westside Subbasin has occurred in the Lower Aquifer. Geologic deposits in this layer source from both the Sierra Nevada to the east and the Diablo Range to the west.

Figure 5, below, portrays the depth to groundwater across the subbasin. The figure shows depth to groundwater is greatest along the foothills and decreases towards the valley floor, consistent with elevation changes and drainage patterns in the area.

Figure 5 Depth to Groundwater



Source: WWD GSA and County of Fresno GSA-Westside 2022a

Groundwater in Storage

The amount of groundwater in storage does not represent the amount of groundwater available for use; rather, groundwater in storage can be used to measure basin balance over time. Quantification of the amount of inflow and outflow required to support sustainable (balanced) conditions in a basin can be used to create a water budget and identify the "sustainable yield," or the maximum amount of water that can be withdrawn annually without causing undesirable effects such as overdraft.

A water budget for the Westside Subbasin was developed to inform the Westside Subbasin GSP required for compliance with SGMA. The Westside Subbasin water budget was created using a numerical integrated groundwater flow model referred to as the Westside Groundwater Model (WSGM). Results of the WSGM indicate that over 27 years (1989 to 2015), groundwater in storage in the Westside Subbasin declined by an average of 19,000 AFY, for a total decrease of 517,000 AF. This trend is consistent with the subbasin's status as Critically Overdrafted. However, the Westside Subbasin GSP notes that although the subbasin is Critically Overdrafted, the total decline in storage represents less than four percent of total outflow from the basin, and less than six percent of total pumping from the basin, which suggests the budget is relatively balanced over the WSGM calibration period (WWD GSA and County of Fresno GSA-Westside 2022a).

Table 3, below, provides the historical and projected water budgets for the Westside Subbasin, as determined through the WSGM and presented in the GSP.

Table 3 Sustainable Yield Estimates

Use Type	Water Budget Period	Volume
Historical Groundwater Sustainable Yield	1989-2015	305,000 AFY
Projected Groundwater Sustainable Yield	2017-2070	270,000 - 294,000 AFY

Source: WWD GSA and County of Fresno GSA-Westside 2022a

The table above shows that during the historical period (1989-2015), sustainable yield for the Westside Subbasin was 305,000 AFY, meaning that up to 305,000 AFY could be withdrawn from the subbasin without causing undesirable effects such as overdraft. As discussed above, the subbasin was also consistently overdrawn by an average of 19,000 AFY over the modeled period. Therefore, sustainable yield under future conditions – to maintain basin balance – was determined to be a range of 270,000 AFY to 294,000 AFY through year 2070.

Groundwater Quality

The quality of surface and groundwater resources is managed by the SWRCB, through its nine RWQCBs, with implementation of a Water Quality Control Plan across all regions. The Project area is addressed in the Tulare Lake Basin Plan (Central Valley RWQCB 2018a). The Tulare Lake Basin Plan identifies water quality objectives for various constituents, including salinity. The Tulare Lake Basin Plan states that no proven means exist at present to reduce groundwater salinity while ongoing human activities continue without increasing salinity concentrations; therefore, the water quality objectives for salinity focus on controlling the rate of increase (Central Valley RWQCB 2018a, Section 3.2.5).

Many areas of the Lower Aquifer are characterized by elevated TDS, with concentrations exceeding the upper SMCL of 1,000 mg/L across most of the subbasin. Degraded water quality is less prevalent in the Lower Aquifer than in the Upper Aquifer. Review of available data extending to 1995 suggests

an overall slight improvement in TDS concentrations in the Lower Aquifer (WWD GSA and County of Fresno GSA-Westside 2022a).

3.1.2 Groundwater Management

This section describes management of the Westside Subbasin under SGMA, and discusses some of the actions contributing to groundwater management, including through land use conversions and water supply allocations.

Sustainable Groundwater Management Act

In 2014, SGMA established a framework for local groundwater management under which the DWR assigns priority levels to groundwater basins based on existing water balance conditions. The Westside Subbasin is designated by the DWR as Critically Overdrafted, which makes it a top priority under SGMA. The purpose of SGMA is to bring overdrafted basins into sustainable conditions by 2040 and to maintain sustainable conditions in the future. To accomplish this, SGMA requires all groundwater basins to be managed by a DWR-approved GSA, which is responsible for developing and implementing a GSP for the respective basin. In the Westside Subbasin, WWD and the County of Fresno have both established as DWR-approved GSAs: the WWD GSA and the County of Fresno GSA-Westside. The WWD GSA is responsible for the majority of the subbasin, while the County of Fresno GSA-Westside is responsible for unincorporated land consisting of several small areas along the western and eastern edge of the subbasin that extend beyond WWD boundaries.

The WWD GSA and the County of Fresno GSA-Westside operate collaboratively through a Memorandum of Understanding (MOU), which allows them to develop one comprehensive GSP for the subbasin. Both the WWD GSA and the County of Fresno GSA-Westside have authority to implement the GSP through their statutory land use and water management responsibilities pursuant to constitutional police powers. The MOU between the GSAs for joint management of the subbasin allows the WWD GSA to implement the GSP in all portions of the Westside Subbasin, including unincorporated county areas. This allowance does not alter the authority of the County of Fresno GSA-Westside over the subject lands; it simply provides authority to the WWD GSA.

The purpose of SGMA is to bring groundwater basins into sustainable conditions by 2040 and to maintain sustainable conditions in the future. This is accomplished through the planning and implementation of basin-specific project and management actions (PMAs) outlined in the respective GSPs. As required by SGMA, the Westside Subbasin GSP sets forth PMAs which are designed to support the reversal of overdraft conditions. The Westside Subbasin PMAs involve management strategies including:

- Provide access to more reliable surface water supplies to existing water users, to stabilize groundwater reliance through dry years;
- Conduct conjunctive use management of surface water and groundwater supplies, including through ASR to store wet weather surplus for later use as needed; and
- Control for water demands through implementation of a water supply allocation system.

The Westside Subbasin GSP was approved by DWR in 2023. Changes or progress made towards PMA implementation is documented in Annual Reports, which are required by SGMA to be submitted to DWR for review and approval. There are five PMAs for the Westside Subbasin. These include PMA Project No. 3, *Aquifer Storage and Recovery*, which was expanded in 2021 to include on-farm recharge and percolation ponds based upon WWD's Groundwater Credit Pilot Program and WWD's

Guidance for Processing Groundwater Recharge Project Applications (WWD GSA and Fresno County GSA 2022a). The guidance document describes that groundwater credits would be allocated by WWD to water users within the Westside Subbasin that develop qualifying recharge projects and provide WWD the data needed to demonstrate the respective project's recharge benefits (WWD 2022a).

WWD Groundwater Recharge

Since 2019, WWD has been working with landowners within the District to establish and invest in on-farm recharge projects, with the goal of using surplus water supply when available to improve groundwater levels in the Westside Subbasin (Lower and Upper Aquifers). More than 300 recharge projects have been processed to date. With increased surface water available from the 2022/20233 water year, WWD has set a goal of recharging 200,000 AF of groundwater to the Westside Subbasin by February 2024. As of September 2023, WWD has succeeded in recharging 127,000 AF, or more than half the total goal. (WWD 2023i)

3.1.3 Groundwater Allocations

After construction of the Project, existing intermittent agricultural operations would cease on parcels within the Project site. In addition, upon transfer of the WWD-owned parcels to ownership by the Project companies, a non-irrigation covenant would be recorded on the respective parcels in accordance with a Court order requiring the non-irrigation covenant. Therefore, commercial irrigated agricultural operations would no longer be viable on parcels owned by Project companies and subject to the non-irrigation covenant. There are also agricultural operations and associated groundwater extraction activities along the gen-tie easement parcels; these activities would continue by others, and would not be affected by development of the Project.

Settlement Agreement Allocations

The terms of the 2015 settlement agreement between the USDOJ and WWD provide for 2 AFY of groundwater to be produced for every 320 acres of land.

As the primary GSA for the Westside Subbasin, WWD's groundwater allocations (as specified in the confidential Option Agreement with Project companies) are consistent with the objectives of SGMA and the Westside Subbasin GSP, specifically to achieve overdraft reversal and restoration of sustainable conditions in the groundwater basin.

Aquifer-Specific Groundwater Allocation

The Westside Subbasin GSP further sets forth groundwater pumping provisions for the Lower Aquifer under an "Aquifer Specific Groundwater Allocation," which provides an "initial aquifer specific groundwater pumping allocation" of 0.60 AFY per gross-acre of land (WWD GSA and County of Fresno GSA-Westside 2023a). As stated in the GSP (page 4-11), parties qualifying for the Aquifer Specific Groundwater Allocation include landowners who can "make reasonable and beneficial use of groundwater;" eligibility does not consider acreage or prior use of groundwater utilization.

3.1.4 Availability for Project

Total anticipated groundwater made available for the Project from the settlement agreement allocation is summarized below. This estimate is based on groundwater production rights associated with the Project site's land purchase.

> **9,000 acres of Project site x 2 AFY/320 acres = 56 AFY total available from groundwater allocations**

Production of this volume of water from the Westside Subbasin is sustainable because it is approximately 1% of the sustainable rate of extraction included in WWD's GSP, and is therefore accounted for in WWD's groundwater management strategy and the Westside Subbasin GSP.

3.2 Local Surface Water Conditions

The Project is located in the southwestern portion of the San Joaquin Valley which comprises the southern portion of the Central Valley. Two major river systems drain the Central Valley, including the Sacramento River north of the Sacramento-San Joaquin River/San Francisco Bay Delta ("Delta"), and the San Joaquin River south of the Delta, where the Project is located. The San Joaquin River flows northwest for 360 miles, merging tributaries including the Merced River, Tuolumne River, Stanislaus River, and Mokelumne River.

The Project Site is located within the Upper Dry Subbasin drainage area within the Tulare Lake hydrologic region. The Tulare Lake hydrologic region covers about 16,800 square miles and includes all of Tulare and Kings counties, and most of Fresno and Kern counties. The majority of the main Project site (approximately 85 percent) is located within the Fresno Slough and Mud-Dam Fresno Slough watersheds of the Upper Dry Subbasin drainage area. Based upon review of data from the USGS' National Hydrography Dataset on surface water flowlines across the U.S., there are no well-defined hydrologic features on the Project site (Intersect Power 2022). There is also no evidence of intermittent flowlines where surface waters would occur seasonally, or ephemeral flowlines where some amount of flow would be present throughout the year. Surface water on the Project site occurs as stormwater in direct response to precipitation events and moves as sheet flow across the relatively level Project site.

3.2.1 Imported Water

Central Valley Project

The CVP is a complex, 400-mile network of dams, reservoirs, canals, hydroelectric powerplants, and other facilities both north and south of the Delta. The USBR operates the CVP and has long-term agreements to supply water to more than 250 contractors. The CVP regulates Sacramento River Basin (north of the Delta) and San Joaquin River Basin (south of the Delta) runoff to meet water demands in the Sacramento Valley, San Francisco Bay Area, San Joaquin Valley, and Tulare Lake Basin (USBR 2008, 2020b).

The CVP has water service contracts to deliver about 6.275 MAF (million acre-feet) per year. CVP contractors include the Sacramento River Settlement Contractors (Settlement Contractors), the San Joaquin River Exchange Contractors (Exchange Contractors), M&I contractors (urban users), agricultural contractors in the San Joaquin and Tulare basins, and wildlife refuges. Each CVP contract type has a different priority for water delivery.

CVP water is conveyed via main canals in accordance with long-term contracts negotiated with irrigation districts (including WWD) and other local organizations; distribution of water from the main canals to the individual users is the responsibility of the local districts (USBR 2023). WWD is a CVP contractor and pumps CVP water from the San Luis Canal into WWD's distribution system for municipal, industrial, and agricultural water users. Permanent entitlement to annual irrigation deliveries were issued in 2020, which established WWD as an Operating Agency for the CVP, with its own distribution system consisting of Reaches 1 and 2 of the Coalinga Canal (USBR 2023).

WWD does not have a USBR M&I water supply contract, but it does exercise provisions in its USBR Agricultural Water Service Contract to provide water for "incidental agricultural purposes" which include M&I activities incidental to agricultural operations (e.g., single-family dwellings, farm housing, commercial operations, and industrial operations) (WWD 2023c). WWD's Article 19.4 (B) of its "Regulations Regarding Application for Use of Municipal and Industrial Water Within Westlands Water District - Application for Water" establishes an application process for users to request service for M&I water.

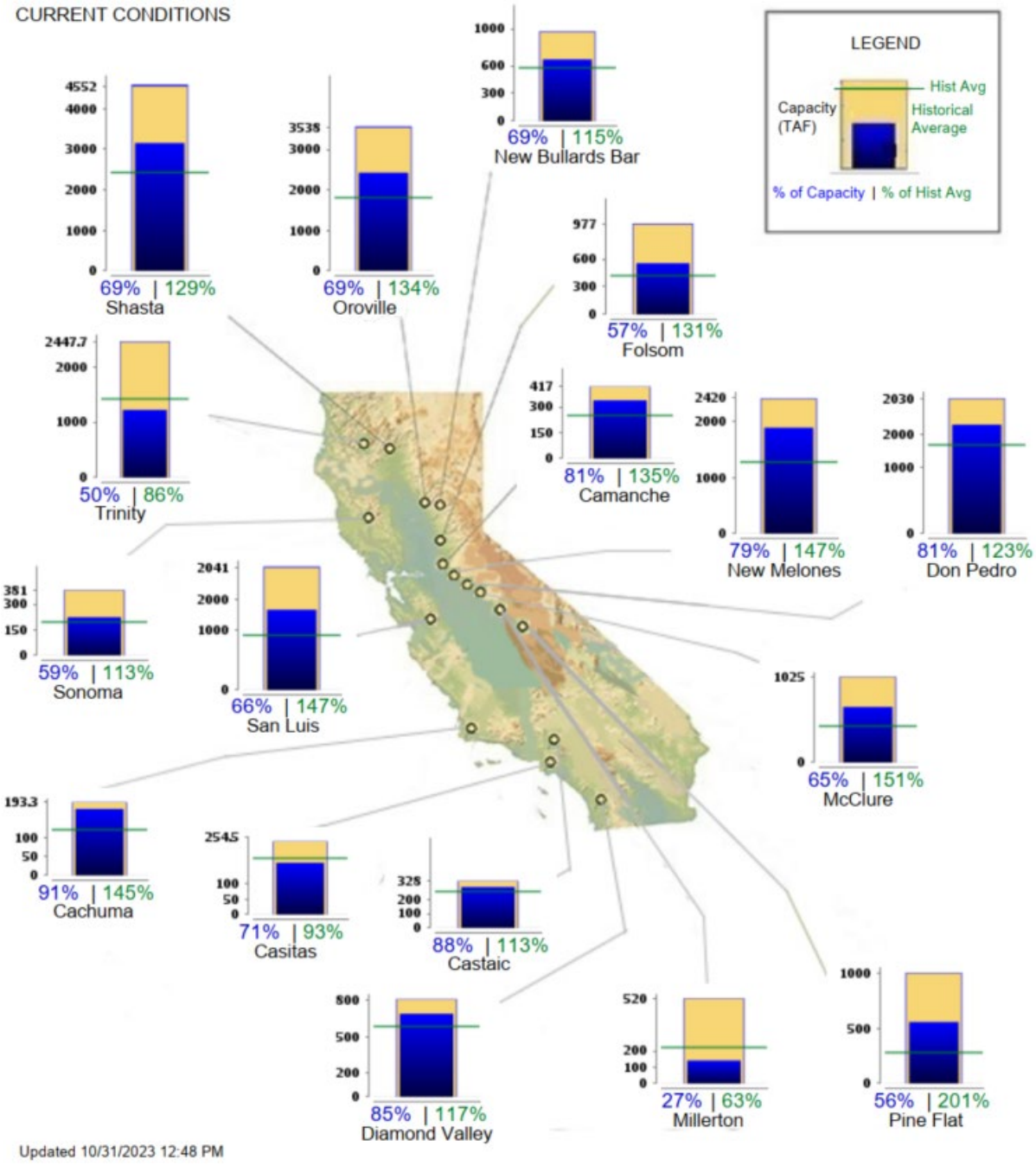
WWD Regulations also specify that when the purpose of requested M&I water is for a solar development and the request is for more than 5 AFY per 160 acres of land, the applicant must "identify a source of water that will, at the applicant's expense, be made available to the District for the proposed M&I Use" (WWD 2013). In this case, the Project does not intend to seek an allocation from WWD of surface water, and so the requirement to obtain such alternative sources does not apply at present. The Project's use of extracted groundwater for solar and M&I purposes is not expected to exceed 39 AFY (refer to Table 2 above) and is not subject to the limitations on use of surface water or upon requested allocations from WWD.

3.2.2 Wet Weather Surplus Flows

Wet weather flows consist of surface water runoff that occurs during years of above-average precipitation, including snowpack. Wet weather flows can result in surplus flows, which consists of any supply available in excess of local demands. This is water that is available after all existing demands and contractual obligations are met for the respective water year. During Water Year 2022/2023, weather in the Central Valley was marked by anomalously cold temperatures that were persistent from November 2022 through March 2023; temperatures across much of the West were among the lowest third on record since 1895 for Water Year 2023 (NIDIS 2023). In California, this weather brought drought relief after three consecutive dry years, with observed runoff above normal through June 2023 and expected to continue throughout the summer (NIDIS 2023).

When wet weather surplus occurs, it may be captured and stored for use during dry periods, and to relieve local groundwater production. The wet weather that occurred during the 2022/2023 water year substantially increased the amount of water stored in reservoirs throughout California. Figure 6, below, portrays reservoir conditions across California as of October 31, 2023.In the Tulare Lake region where WWD's service area is located, the amount of water in reservoirs in October 2023 was higher than the historical average by a minimum of 125 percent (Helms Creek Reservoir) and a maximum of 610 percent (Tule River Reservoir) (DWR 2023b).

Figure 6 Current Reservoir Conditions in California



Groundwater Banking

When wet weather surplus flows are available, water agencies divert those surface flows into a recharge area or basin for percolation into the underlying groundwater basin where it can be stored for future use. Water banking requires access to surface water supplies and storage space available in the underlying aquifer. Locally, WWD's Agricultural (Ag) Aquifer Storage and Recovery (ASR) Program was approved in October 2019 and uses surplus water supplies to inject water into the local groundwater basin for temporary storage and later use (WWD 2019a). Sources of water for

injection under the Ag-ASR Program include Section 215 water and carryover water from the San Luis Canal, as well as flood discharge from the Kings River, as available (WWD 2019c). Given the overdrafted nature of the Westside Subbasin (see Section 4.1 above), there is adequate storage capacity for banking of wet weather surplus flows.

WWD Sale of Wet Weather Surplus

During 2021, persistent drought conditions caused WWD to fallow over 200,000 acres of agricultural land due to water supply shortages (WWD 2022c). WWD also identified the need to invest in infrastructure to increase capacity to capture water when available and store it for use in times of drought. Drought conditions continued into 2022, and WWD reported in May 2022 that it had received requests for 158,248 AF of Supplemental Water, of which it was able to fulfill 18,840 AF (approximately 12 percent) to timely applicants (WWD 2022d). However, during the 2022/2023 water year, multiple atmospheric rivers brought high amounts of precipitation to California, resulting in full allocation of CVP water contracts, increased availability of Supplemental Water, and increased efforts to bank surface water in the ground for future use. As of September 2023, WWD had successfully recharged approximately 127,000 AF of water to the Westside Subbasin, more than half of its goal of 200,000 AF by March 2024 (WWD 2023i).

As of May 2023, WWD reported that landowners within its service area had the capability to recharge up to 3,300 AF of water per day, with groundwater recharge efforts expected to continue increasing with the implementation of additional recharge and storage projects (WWD 2023d). This demonstrated WWD's successful fulfillment of the need it identified in February 2022 to invest in storage and recovery programs to store water in the ground when available for later use (WWD 2022c). In addition to supporting recharge and storage efforts, the wet weather in 2022/2023 also substantially increased WWD's access to Supplemental Water.

In July 2023, WWD announced it had successfully fulfilled requests received for Supplemental Water through the allocation of 6,469 acre-feet (AF), leaving approximately 36,000 AF of Supplemental Water remaining available (WWD 2023e) through WWD. This is in comparison to May 2022, where WWD was limited in its ability to fulfill requests for Supplemental Water due to drought, allocating approximately 12 percent of all requests. In August 2023, allocations of Supplemental Water had increased to 7,311 AF, with approximately 35,000 AF remaining available (WWD 2023f) through WWD. This Supplemental Water is in excess of allocations to agricultural and other users within WWD.

In September and October 2023, WWD announced its remaining supply of Supplemental Water totaled approximately 13,000 AF (WWD 2023g, WWD 2023h). Further, WWD stated that the CVP currently has approximately 7,724,000 AF of water stored in northern CVP reservoirs, representing approximately 139 percent of the 15-year average (WWD 2023h). In addition, WWD is operating a Water Turn Back Pool for up to 30,000 AF to use for groundwater recharge activities. A Turn Back Pool means that agricultural users do not need their full allocations in this water year and that the "turned back" water is available for purchase and banking. As of September 8, 2023, WWD received requests to turn back 19,963 AF of 2023-2024 CVP Contract Water (WWD 2023h). In addition, excess water allocations can be sold by private landowners directly to other landowners.

3.2.3 Availability for Project

Total anticipated surplus surface water made available from WWD, primarily due to the extremely wet 2022/2023 water year, is summarized below. Under the proposed Project, all water required over the Project lifetime would be acquired and stored via groundwater banking for later use as needed. WWD's 13,000 AF of available Supplemental Water, combined with the Water Turn Back Pool of 30,000 AF, both available in October 2023, results in adequate water supply to meet Project needs available for banking.

> **13,000 AF Supplemental Water + 30,000 AF Turn Back Pool = 43,000 AF total surplus water available from WWD**

Purchase and recharge of this volume of water into the Westside Subbasin would provide adequate water supply for construction and operation of the solar and hydrogen electrolyzer components of the Project over the 20-year planning horizon assessed herein. Surface water banked in the ground is sustainable because it complies with WWD groundwater management strategy and programs. Long-term groundwater banking proposed under the Project would also provide groundwater recharge consistent with WWD's ongoing recharge activities.

In addition, there is currently an active market among holders of water allocations who have excess supply due to the substantial precipitation in 2022/2023; these parties are incentivized to sell excess supply (allocations) to private buyers by the possibility of procuring higher prices than would be realized by returning unused allocations to WWD. Intersect Power is active in this market for the purchase of surplus water supply allocations, and expects to procure up to 100% of the water for the electrolyzer (20,000 AF) before March 31, 2024 from this market.

4 Water Supply for the Project

Two different and complimentary water supplies have been identified for the Project: land purchase with annual groundwater production, and surplus surface water flow for long-term banking. Table 4, below, provides a summary of the Project water demands over the required 20-year planning horizon, as well as an overview of the two identified water supplies that would be implemented in tandem during this timeframe.

Table 4 Comparison of Water Demands and Available Supplies (20 Years)

Demand Type	Water Demand (AF)	Water Supply Source	Water Supply (AF)	Adequate Supply Available?
Groundwater				
PV solar and M&I	780 AF (39 AFY)	Land purchase with attached groundwater allocations	1,120 AF (56 AFY)	YES
Surface Water				
Construction[1]	1,210 AF	Surface water surplus flow with storage via banking	43,000 AF	YES
Electrolyzer	20,000 AF (1,000 AFY)			
Totals	**21,990 AF**		**44,365 AF**	**YES**

1. The construction water demand would range between 1,100 AF to 1,210 AF for the construction duration; for the purposes of this WSA, the most conservative annual use rate and total demand are considered.

Due to the groundwater allocations provided in the 2015 settlement agreement and confidential Option Agreement, as well as the increased ability for groundwater banking of surplus water for future use, and the availability of Supplemental Water supply associated with the wet weather of water year 2022/2023, WWD's water supply availability and reliability are considered sufficient to support the Project. Ongoing operation of the Project facilities for solar and M&I use would be supported through annual groundwater production from onsite wells of 39 AFY, or up to the maximum 56 AFY allowable through property-based groundwater allocations, for a total of up to 1,120 AF over the 20-year planning horizon. In addition, up to 20,870 AF of surplus surface water would be purchased from WWD and stored through groundwater banking for use as needed over the 20-year planning horizon assessed herein. The use of surplus water stored via groundwater banking would result in no net drawdown to local groundwater, as only the amount of water contributed to banking would be used for the Project.

4.1 Land Purchase with Existing Groundwater Rights

M&I groundwater pumping rights would be conferred to the Project companies through the transfer of land from WWD to the Project companies. In total, 9,000 acres of land would be transferred, consisting of parcels within the Project's PV development area. As stipulated in the Option Agreement between WWD and Project companies, the purchase of the Project site from WWD would confer M&I rights consisting of 2 AF of groundwater per 320 acres of land per year to support solar development. Accounting for the PV development area's cumulative 9,000 acres, M&I rights

conferred to Project companies would total 56 AFY. Use of these groundwater rights is a sustainable use aligned with WWD's groundwater management strategy for the Westside Subbasin.

Availability & Reliability

Upon exercising the option to purchase the WWD lands, the existing groundwater rights would be conferred to the Project companies. The option would be exercised upon completion of the CEC opt-in application and when the CEQA document is certified. The Project companies would purchase land with water rights and use the associated groundwater allocation for solar and M&I use under the Project.

4.2 Surface Water Surplus and Storage

Remaining water supply for the Project (20,870 AF) would be secured through purchase of Supplemental Water and/or Turn Back Pool surplus water through WWD and from private landowners who are willing to sell surplus allocations. Purchase of this wet weather surplus flow would occur based on water year 2022/2023 excess supply and put into storage in the Westside Subbasin aquifer for future use by the Project. Storage would be conducted through groundwater banking. Water banking credits would be generated through storage and WWD authorization, and the water would be extracted using onsite groundwater production wells in future years.

As described above, Water Year 2022/2023 has been characterized by unusually low temperatures and high precipitation; these conditions have resulted in availability of Supplemental Water and/or Turn Back Pool Water through WWD. Because wet weather surplus is inherently tied to weather conditions that do not consistently occur in the Central Valley, the ability to immediately bank water received as surplus is important to ensuring its beneficial use and maximum benefit. WWD is currently using wet weather surplus in its Ag-ASR Program, and offering additional wet weather surplus to customers as part of District recharge programs. Private landowners are also currently using field flooding percolation techniques to recharge the aquifer with surplus surface water flows.

Availability & Reliability

The availability of wet weather surplus flow is dependent upon the occurrence of above-average precipitation and unusually large storm events, as occurred during the 2022/2023 water year. The Project companies would purchase Supplemental Water and/or Turn Back Pool water from WWD and surplus allocations to private water users for banking in the Westside Subbasin. The availability and reliability of this supply source are both considered high as WWD has up to 43,000 AF of surplus water currently (as of October 2023) available, which is more than the Project's calculated demands of up to 21,990 AF. Additional supplies of water are currently available from private landowners and can be banked privately for withdrawal in future years. The Project is in the process of acquiring rights with respect to adequate water supplies for banking the requirements for Project use over the Project lifetime including the 20-year planning horizon assessed herein.

The Supplemental Water and/or Turn Back Pool water agreements are not identified in this document because acquisition processes are currently underway and subject to confidentiality.

4.3 Conclusions

Water supply for the Project would be developed through acquisition of a combination of surplus surface water and groundwater rights associated with the Project site. As shown in Table 4, above, both supply sources are reliably available to meet the Project demands from construction through operation. The anticipated M&I and solar groundwater allocation is relatively small (56 AFY) and could be reliably pumped from the Westside Subbasin, whose sustainable yield is 270,000 – 294,000 AFY or 0.6 AFY per acre. The Project's groundwater allocation is 0.02% of the Subbasin's aggregate estimated sustainable yield and approximately 1% of the sustainable yield on the Project site itself. This component of the Project's proposed water supply would be resilient in normal, dry, and multiple dry years because its proportion of the Subbasin water balance is small and sustainable, and the groundwater right was established through a settlement agreement.

Further, the remaining water demands for the Project (20,870 AF) would be served with banking of wet weather surplus flows and extraction over the 20-year assessment period. Sufficient surplus water from the 2022/2023 water year would be banked to support Project construction and operation over at least 20 years. This water supply is available in quantities greater than Project demands, with at least 43,000 AF currently available and being advertised for purchase from WWD. This component of the Project's proposed water supply would be permanently banked, so it would be available in normal, dry, and multiple dry years throughout the 20-year planning horizon assessed herein. No direct impacts to the groundwater basin or its beneficial uses and users would occur during dry and multiple-dry years because the Project water would be banked in advance of withdrawals and would not exceed banked volumes or otherwise impact native groundwater supplies or availability.

In conclusion, based upon the analysis provided in this WSA, there are long-term sustainable sources of water identified for the Project and the Project's demand would be satisfied by such sources.

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